

FACT SHEET FOR NPDES PERMIT WA 0037265
Occidental Chemical Corporation
July 2009

PURPOSE of this Fact Sheet

This fact sheet explains and documents the decisions the Washington State Department of Ecology (Ecology) made in drafting the proposed National Pollutant Discharge Elimination System (NPDES) permit for Occidental Chemical Corporation (OxyChem).

The Environmental Protection Agency (EPA) developed the NPDES permitting program as a tool to “restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.” EPA delegated to Ecology the power and duty to write, issue, and enforce NPDES permits within Washington State. Both state and federal laws require any industrial facility to obtain a permit before discharging waste or chemicals to a water body.

An NPDES permit limits the types and amounts of pollutants the facility may discharge. Those limits are based either on (1) the pollution control or wastewater treatment technology available to the industry, or on (2) the receiving water’s customary beneficial uses. This fact sheet complies with Section 173-220-060 of the Washington Administrative Code (WAC), which requires Ecology to prepare a draft permit *and accompanying fact sheet* for public evaluation before issuing an NPDES permit.

PUBLIC ROLE in the Permit

Ecology makes the draft permit and fact sheet available for public review and comment at least 30 days before issuing the final permit to the facility operator (WAC 173-220-050). Copies of the fact sheet and draft permit for OxyChem, NPDES permit WA 0037265, are available for public review and comment from July 22, 2009, through August 21, 2009. For more details on preparing and filing comments about these documents, please see **Appendix A - Public Involvement Information**.

Before publishing the draft NPDES permit, OxyChem reviewed it for factual accuracy. Ecology corrected any errors or omissions about the facility’s location, product type or production rate, discharges or receiving water, or its history.

After the public comment period closes, Ecology will summarize substantive comments and our responses to them. Ecology will include our summary and responses to comments to this Fact Sheet as **Appendix C - Response to Comments**, and publish it when issuing the final NPDES permit. Ecology will not revise the rest of the fact sheet, but the full document will become part of the legal history contained in the facility’s permit file.

Martin Werner, P.E. prepared the permit and this fact sheet.

SUMMARY

As described later in this factsheet, Ecology proposes to lower permit limits for several constituents in the ground water treatment system effluent. Ecology also proposes adding monitoring points for facility stormwater before it mixes with other flows. The monitoring point in the current permit is the combined effluent flow of stormwater, cooling water and treated ground water. Finally, Ecology determine that Occidental Chemical Corporation may discontinue monitoring temperature of the combined effluent

because there is no reasonable potential that the discharge will cause the receiving water to exceed the water quality criteria for that parameter.

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I. INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later amendments in 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One mechanism for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), administered by the federal Environmental Protection Agency (EPA). The EPA authorized the state of Washington to manage the NPDES permit program in our state. Our state legislature accepted the delegation and assigned the power and duty for conducting NPDES permitting and enforcement to the Washington State Department of Ecology (Ecology). The legislature defined Ecology's authority and obligations for the wastewater discharge permit program in 90.48 RCW (Revised Code of Washington).

Ecology adopted rules describing how it exercises its authority:

- Procedures Ecology follows for issuing NPDES permits (chapter 173-220 WAC)
- Water quality criteria for surface waters (chapter 173-201A WAC) and for ground waters (chapter 173-200 WAC)
- Sediment management standards (chapter 173-204 WAC)
- Submission of Plans and Reports for Construction of Wastewater Facilities (chapter 173-240 WAC)

These rules require any industrial facility operator to obtain an NPDES permit before discharging wastewater to state waters. They also help define the basis for limits on each discharge and for performance requirements imposed by the permit.

Under the NPDES permit program and in response to a complete and accepted permit application Ecology must prepare a draft permit and accompanying fact sheet, and make them available for public review before final issuance. Ecology must also publish an announcement (public notice) telling people where they can read the draft permit, and where to send their comments, during a period of 30 days (WAC 173-220-050). (See Appendix A--Public Involvement for more detail about the Public Notice and Comment procedures). After the Public Comment Period ends, Ecology may make changes to the draft NPDES permit in response to comments. Ecology will summarize the responses to comments and any changes to the permit in Appendix C.

II. BACKGROUND INFORMATION

Table 1 - General Facility Information

Applicant:	Occidental Chemical Corporation
Facility Name and Address:	Occidental Chemical Corporation 605 Alexander Avenue Tacoma, WA 98421
Type of Treatment:	Ground Water Site Remediation
SIC Code	4959 (Site Remediation)
Discharge Location:	Hylebos Waterway/Inner Commencement Bay of Puget Sound Latitude: 47° 16' 48" N Longitude: 122° 24' 11" W

Figure 1. Facility Location Map



A. Facility Description

History

The facility originally began as a chlor-alkali production operation in 1929. The plant was owned and operated by Occidental Chemical Corporation (OxyChem) and its predecessors until Pioneer Americas, Inc. (Pioneer) purchased the operation in June 1997. At that time, Pioneer assumed ownership of the facility and responsibility for all chemical production, which included the manufacturing and distribution of chlorine, sodium hydroxide, hydrochloric acid, and calcium chloride. In 2005, Pioneer sold the facility to Mariana Properties, a subsidiary of Occidental Petroleum Corporation. The facility property occupies approximately 33 acres in the industrial port area of Tacoma, Washington.

OxyChem also operated a chlorinated solvents (trichloroethylene, tetrachloroethylene) production plant at the northeast end of the facility from 1947 to 1973. This operation resulted in ground water contamination with chlorinated organic compounds.

In February 2002, Pioneer ceased producing chlorine, sodium hydroxide, hydrochloric acid, and calcium chloride. OxyChem, who resumed ownership of the facility in 2005, demolished the industrial plant in 2006-2008.

Currently, the facility is part of a ground water corrective action being conducted under the Resources Conservation and Recovery Act (RCRA) Permit WAD 009242314. Ecology provides oversight for the clean-up which OxyChem manages. Studies to assess ground water contamination began in 1979. Ground water extraction and treatment for the chlorinated solvent contamination caused by the

chlorinated solvent production began in February 1994, and it is ongoing. The chemicals of concern in the ground water include vinyl chloride; 1,1,dichloroethylene; methylene chloride; chloroform; carbon tetrachloride; trichloroethylene; 1,1,2 trichloroethane; tetrachloroethylene; and 1,1,2,2, tetrachloroethane.

Since 1992, OxyChem has had an NPDES permit to discharge the treated ground water. Ecology most recently modified the permit in February 2007. Ecology proposes to reissue an NPDES permit to OxyChem for the next five years. This proposed permit has limits for each of the chemicals of concern listed above in the ground water. Permit limits are based on best professional judgment considering the treatment technology and past and ongoing performance of the treatment system.

Industrial Process

The facility does not have any active industrial processes at this time. OxyChem shut down all of its past industrial activities and has dismantled its building and other structures. Current operations include only a ground water remediation facility (facility) located at 605 Alexander Avenue, Tacoma, Washington. Glenn Springs Holdings, Inc., a subsidiary of Occidental Petroleum Corporation, manages and operates the facility. The facility includes a ground water extraction system, treatment plant, and monitoring system. After it is treated and monitored, the facility combines the ground water with non-contact cooling water that is used in the treatment process and facility stormwater. OxyChem discharges the combined effluent to the Hylebos Waterway of Inner Commencement Bay in Puget Sound.

Wastewater Treatment

Currently, OxyChem extracts contaminated water from a series of 25 ground water wells on the facility property and adjacent Port of Tacoma property. It may need to install additional extraction wells in the future. The ground water is contaminated with volatile chlorinated organic compounds. OxyChem uses a combination of air stripping and carbon adsorption to treat the contaminated ground water (see a flow chart of treatment process in Appendix E).

The contaminated ground water is piped into a series of tanks which allow solids to settle out for removal. The tanks also serve to equalize flow to the remainder of the treatment system. OxyChem then pumps the contaminated water through five air stripper modules in series. Air is pumped through the air stripper countercurrent to the contaminated water flow to remove the chlorinated organic solvents. Each air stripper module in series removes more of the organic solvent contamination. The facility then directs treated water to two activated carbon beds in series. The carbon beds remove trace amounts of organics still in the water and serve as a backup treatment unit in case of temporary air stripper failure. The permit requires OxyChem to monitor the discharge directly after the final carbon column and before the treated ground water is combined with any other water.

Air from the air stripper is directed to a catalytic oxidizer. This air treatment unit converts the chlorinated organic compounds in the air stream to carbon dioxide, hydrogen chloride and water vapor. HCl is removed from the air stream using an acid scrubber. OxyChem has registered its air treatment system with the Puget Sound Clean Air Agency.

Solid Wastes

OxyChem's Solid Waste Control Plan specifies how it manages the solid wastes generated by treating contaminated ground water, maintaining the ground water monitoring and extraction system, and various supporting activities. The site manager approves all procedures and processes for storage, treatment, transportation and disposal of all solid wastes at the facility. OxyChem must submit all proposed revisions or modifications to the solid waste control plan to Ecology for review and approval at least 30

days prior to implementation. Once approved, OxyChem must comply with any plan modifications. The proposed permit requires the facility to submit an update of the solid waste control plan by *reserve for issuance*.

Discharge Outfall

The outfall is located along the Hylebos Waterway at latitude 47° 16' 48" N and longitude 122° 24' 11" W. The treated ground water mixes with noncontact cooling water and stormwater before the combined flow enters the final 36 inch discharge pipe.

The 36 inch discharge pipe enters the midpoint of a 28 foot long, 36 inch diameter diffuser header pipe 26 feet below the Mean Lower Low Water (MLLW) in the Hylebos Waterway. Each end of the diffuser header pipe has a discharge port that directs the discharge perpendicular to the shoreline.

The chemical manufacturing facility previously used this discharge pipe and diffuser when it operated. Currently, the system is only used for the flows described above, and the flow is lower than the historic discharge from this outfall.

The draft permit includes sampling locations before the final discharge outfall. The draft permit requires OxyChem to collect treated ground water samples from the ground water treatment plant before it mixes with other flows. Facility stormwater is collected from four different points before it mixes with other flow.

B. Permit Status

OxyChem submitted an application for permit renewal on January 2, 2009. Ecology had issued the previous permit for this facility on May 3, 2005.

The previous permit included the limits listed in Table 2 for the ground water treatment process effluent.

Table 2. Current Effluent Limits – Ground Water Treatment System Effluent (Outfall #002)

Parameter	Units	Maximum Daily Limit
Flow	gallons per day	Report
Chloroform	micrograms/liter (µg/L)	75
Carbon tetrachloride	micrograms/liter (µg/L)	10
1,1 Dichloroethylene	micrograms/liter (µg/L)	5
1,1,2 Trichloroethane	micrograms/liter (µg/L)	5
1,1,2,2, Tetrachloroethane	micrograms/liter (µg/L)	180
Trichloroethylene	micrograms/liter (µg/L)	440
Tetrachloroethylene	micrograms/liter (µg/L)	50
pH	standard units	Between 6.0 and 9.0

The previous permit included the effluent limits listed in Table 3 for the combined water stream that included ground water treatment process effluent, stormwater and noncontact cooling water.

Table 3. Current Effluent Limits – Combined Discharge Effluent (treated ground water, stormwater, noncontact cooling water) (Outfall #001)

Parameter	Units	Maximum Daily Limit
Flow	gallons per day	Report
Oil and Grease		No visible sheen
TSS	milligrams/liter	30
Copper	micrograms/liter	Report
Zinc	micrograms/liter	Report
Temperature	degrees centigrade	Report
pH	standard units	Between 6.0 and 9.0

C. Summary of Compliance with Previous Permit Issued

Ecology staff last conducted a non-sampling compliance inspection on November 16, 2006.

OxyChem has complied with the effluent limits and permit conditions of the permit issued on May 3, 2005, consistently since issuance. Ecology assessed facility compliance based on its review of the facility's Discharge Monitoring Reports (DMRs) and on inspections conducted by Ecology.

D. Wastewater Characterization

The concentration of pollutants in the discharge was reported in the NPDES application and in discharge monitoring reports. OxyChem also collects information on its influent as required by their Waste Analysis Plan subject to the dangerous waste regulations. The tabulated data in Table 4 represent the quality of the effluent from the ground water treatment system from June 2005 until February, 2009.

Table 4: Wastewater Characterization from Ground Water Treatment System

Parameter	Maximum Ground Water Influent Concentration	Maximum Ground Water Treatment Effluent Concentration
Chloroform	2600 µg/L	Nondetect (< 1 µg/L)
Carbon Tetrachloride	< 500 µg/L	Nondetect (< 1 µg/L)
1,1 Trichloroethylene	< 500 µg/L	Nondetect (< 1 µg/L)
1,1,2 Trichloroethane	< 500 µg/L	Nondetect (< 1 µg/L)
1,1,2,2, Tetrachloroethane	< 500 µg/L	Nondetect (< 1 µg/L)
Trichloroethylene	17000 µg/L	Nondetect (< 1 µg/L)
Tetrachloroethylene	2100 µg/L	Nondetect (< 1 µg/L)
Methylene Chloride	700 µg/L	1.4 µg/L
Vinyl Chloride	9900 µg/L	No regular monitoring data

Data in Table 5 characterize the combined outfall #001 discharge during 2007 and 2008.

Table 5. Wastewater Characterization for Combined Discharge Effluent (treated ground water, stormwater, plus noncontact cooling water).

Parameter	Range for Effluent During 2007 through 2008
Oil and Grease	No visible sheen reported
Total Suspended Solids	<2 to 14 mg/L
Copper	1.4 to 3.7 µg/L
Zinc	<1 to 14 µg/L

Temperature	8.2 – 14.3 °C
pH	6.9-8.1

E. Description of the Receiving Water

OxyChem discharges to saltwater in the Hylebos Waterway which is an extension of Inner Commencement Bay in Puget Sound. The facility is in an area used for heavy industry.

Inner Commencement Bay is included on the EPA 303(d) list for chlorinated pesticides, DDT, High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAH), dieldrin, and PCBs in tissue.

F. SEPA Compliance

Regulation exempts reissuance of any wastewater discharge permit from the SEPA process when the proposed permit conditions are no less stringent than state rules and regulations. That exemption applies to reissuance of this permit.

III. PROPOSED PERMIT CONDITIONS

Federal and State regulations require that effluent limits in an NPDES permit must be either technology or water quality-based.

- Technology-based limits are based upon the treatment methods available to treat specific pollutants. Technology-based limits are set by the EPA and published as a regulation, or Ecology develops the limit on a case-by-case basis (40 Code of Federal Regulations [CFR] 125.3, and chapter 173-220 WAC).
- Water quality-based limits are calculated so that the effluent will comply with the Surface Water Quality Standards (chapter 173-201A WAC), Ground Water Standards (chapter 173-200 WAC), Sediment Quality Standards (chapter 173-204 WAC) or the National Toxics Rule (40 CFR 131.36).
- Ecology must apply the most stringent of these limits to each parameter of concern. These limits are described below.

The limits in this permit reflect information received in the application for permit reissuance and from supporting reports (operation and maintenance manual, stormwater pollution prevention plan, etc.). Ecology evaluated the permit application and determined the limits needed to comply with the rules adopted by the state of Washington. Ecology does not develop effluent limits for all reported pollutants. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation.

Nor does Ecology usually develop permit limits for pollutants that were not reported in the permit application but that may be present in the discharge. The permit does not authorize discharge of the non-reported pollutants. During the five-year permit term, the facility's effluent discharge conditions may change from those conditions reported in the permit application. The facility must notify Ecology, as described in 40 CFR 122.42(a), if significant changes occur in any constituent. Industries may be in violation of their permit until Ecology modifies the permit to reflect additional discharge of pollutants.

A. Design Criteria

Under WAC 173-220-150(1)(g), neither flows nor waste loadings may exceed approved design criteria. The hydraulic capacity of the ground water collection system is 125 gallons per minute (gpm) or 180,000 gallons per day (gpd). Ecology obtained the flow rate from the Operations and Maintenance Manual prepared by Conestoga-Rovers & Associates for OxyChem and dated January 2009. The hydraulic capacity of the overall treatment plant is 150 gpm or 216,000 gpd (from Pioneer Americas LLC, NPDES Permit Renewal Application, January 2003). The air stripper, with a design capacity of 150 gpm, establishes the capacity for the overall treatment system. The carbon units can treat up to 600 gpm. The treatment plant is able to accommodate flow from both the ground water collection system and the contact stormwater from within treatment plant's secondary containment system (note, this treatment plant contact stormwater is manage separately from the facility-wide non-contact stormwater). Over the last two years of the previous permit maximum monthly effluent flow ranged from 136,100 to 199,900 gallons per day.

B. Technology-Based Effluent Limits

OxyChem has treated contaminated ground water using the treatment system since 1994 so Ecology has performance data to evaluate. The treatment system uses air stripping to remove volatile organic contaminants from the ground water followed by carbon adsorption for backup and polishing. This system has proven very effective for removing the contaminants of concern (COC). In fact, OxyChem measured a COC in their effluent above the detection limit only twice over the past five years (methylene chloride was detected at 1.4 µg/L during March 2006, and at 1.3 µg/L during February 2009).

Based on the treatment system past performance, Ecology is using its best professional judgment to lower the permit limits for some of the COC. Table 6 shows information used by Ecology to make that determination.

Table 6: Proposed effluent limits and other information on organic constituents that demonstrate a reasonable potential to exceed human health criteria for the ground water treatment system effluent.

Contaminant of Concern	Maximum Influent Conc. (µg /L)	Maximum Effluent Conc. - 2004 through 2008	Human Health Criteria (µg /L)	Current Effluent Limit. (µg /L)	National Recommended Water Quality Criteria (µg /L)	Proposed Effluent Limit (µg µg /L)
Chloroform	2600 µg/L	Nondetect (< 1 µg/L)	470	75	470	75
Carbon Tetrachloride	< 500 µg/L	Nondetect (< 1 µg/L)	4.4	10	1.6	1.6
1,1 Dichloroethylene	< 500 µg/L	Nondetect (< 1 µg/L)	3.2	5	7100	3.2
1,1,2 Trichloroethane	< 500 µg/L	Nondetect (< 1 µg/L)	42	5	-	5
1,1,2,2 Tetrachloroethane	< 500 µg/L	Nondetect (< 1 µg/L)	11	180	4	4
Trichloroethylene	17000 µg/L	Nondetect (< 1 µg/L)	81	440	30	30
Tetrachloro-ethylene	2100 µg/L	Nondetect (< 1 µg/L)	8.85	50	3.3	3.3

Methylene Chloride	700 µg/L	1.4 µg/L	1600	185	590	185
Vinyl Chloride	9900 µg/L	Not reported	525	No current limit	2.4	2.4

Most of the effluent concentration data OxyChem reported over the past five years were below detection limits. This provides very limited information on their statistical distribution. Therefore, these data are not reliable for calculating effluent limits based on statistical analyses. Instead of using a statistical approach based on past performance to establish new limits, Ecology compared the existing limit, performance data, and the human health criteria to set the proposed limits. When considering human health criteria, Ecology included the National Recommended Water Quality Criteria. Those are based on a more current risk assessment evaluation by EPA and Ecology has also used them as clean-up levels for other aspects of the OxyChem clean-up action. The proposed limits in this draft permit are the most stringent of the Current Effluent Limit, Human Health Criteria, and National Recommended Water Quality Criteria

Based on the treatment plants past performance, Ecology determined that achieving the proposed limits is both technologically achievable and reasonable. In summary, this draft permit establishes technology-based limits and not a water quality-based limit. Even though Ecology used the human health criteria value or the “National Recommended Water Quality Criteria” in some cases, the limits are not water quality based but are technology based.

C. Surface Water Quality-Based Effluent Limits

The Washington State Surface Water Quality Standards (chapter 173-201A WAC) were designed to protect existing water quality and preserve the beneficial uses of Washington's surface waters. Waste discharge permits must include conditions that ensure the discharge will meet established surface water quality standards (WAC 173-201A-510). Water quality-based effluent limits may be based on an individual waste load allocation or on a waste load allocation developed during a basin wide total maximum daily loading study (TMDL).

Numerical Criteria for the Protection of Aquatic Life and Recreation

Numerical water quality criteria are published in the Water Quality Standards for Surface Waters (chapter 173-201A WAC). They specify the levels of pollutants allowed in receiving water to protect aquatic life and recreation in and on the water. Ecology uses numerical criteria along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limits, the discharge must meet the water quality-based limits.

Numerical Criteria for the Protection of Human Health

The U.S. EPA has published 91 numeric water quality criteria for the protection of human health that are applicable to dischargers in Washington State (40 CFR 131.36). These criteria are designed to protect humans from exposure to pollutants linked to cancer and other diseases, based on consuming fish and shellfish and drinking contaminated surface waters. The Water Quality Standards also include radionuclide criteria to protect humans from the effects of radioactive substances.

Narrative Criteria

Narrative water quality criteria (e.g., WAC 173-201A-240(1); 2006) limit the toxic, radioactive, or other deleterious material concentrations that the facility may discharge to levels below those which have the potential to:

- Adversely affect designated water uses.
- Cause acute or chronic toxicity to biota.
- Impair aesthetic values.
- Adversely affect human health.

Narrative criteria protect the specific designated uses of all fresh waters (WAC 173-201A-200, 2006) and of all marine waters (WAC 173-201A-210, 2006) in the state of Washington.

Antidegradation

The purpose of Washington's Antidegradation Policy (WAC 173-201A-300-330; 2006) is to:

- Restore and maintain the highest possible quality of the surface waters of Washington.
- Describe situations under which water quality may be lowered from its current condition.
- Apply to human activities that are likely to have an impact on the water quality of surface water.
- Ensure that all human activities likely to contribute to a lowering of water quality, at a minimum, apply all known, available, and reasonable methods of prevention, control, and treatment (AKART).
- Apply three Tiers of protection (described below) for surface waters of the state.

Tier I ensures existing and designated uses are maintained and protected and applies to all waters and all sources of pollutions. Tier II ensures that waters of a higher quality than the criteria assigned are not degraded unless such lowering of water quality is necessary and in the overriding public interest. Tier II applies only to a specific list of polluting activities. Tier III prevents the degradation of waters formally listed as "outstanding resource waters," and applies to all sources of pollution.

This facility must meet Tier I requirements.

- Dischargers must maintain and protect existing and designated uses. Ecology may not allow any degradation that will interfere with, or become injurious to, existing or designated uses, except as provided for in chapter 173-201A WAC.
- Ecology's analysis described in this section of the fact sheet demonstrates that the existing and designated uses of the receiving water will be protected under the conditions of the proposed permit. Therefore the facility will meet Tier I requirements.

Mixing Zones

A mixing zone is the defined area in the receiving water surrounding the discharge port(s), where wastewater mixes with receiving water. Within mixing zones the pollutant concentrations may exceed water quality numeric criteria, so long as the diluting wastewater doesn't interfere with designated uses of the receiving water body (e.g., recreation, water supply, and aquatic life and wildlife habitat, etc.). The pollutant concentrations outside of the mixing zones must meet water quality numeric criteria.

The current permit has an acute mixing zone of 2.7 and a chronic mixing zone of 15. The proposed permit reauthorizes these mixing zones.

OxyChem has successfully used their ground water treatment process (see "Technology Based Limits") to treat contaminated ground water to levels well below the human health criteria during the most recent permit cycle (past five years). Ecology has determined that OxyChem's treatment and the pollution prevention activities for the ground water treatment system meet the requirements of AKART, and that the effluent should continue to meet water quality criteria at the discharge point for all organic constituents that demonstrate a reasonable potential to exceed human health criteria for the ground water treatment system effluent. Therefore the proposed permit does not apply a dilution factor for those constituents. OxyChem may request a permit modification to adjust permit limits if it begins to extract ground water from different areas of the contaminated ground water plume and determines the treatment system can no longer achieve limits established in this permit.

The primary reason for reauthorizing the mixing zones is for Whole Effluent Toxicity Testing (WET Testing). OxyChem conducted this testing on the combined effluent on two separate sampling dates. In addition to the ground water treatment effluent, the combined effluent includes non-contact cooling water and non contact stormwater. Results from WET Testing during the previous permit cycle showed significant effects for the chronic test on one of the two sampling dates for one test species (Atlantic Mysid) at 100 percent concentration of the combined effluent. WET testing results for the acute test and for the other species of the chronic test (Topsmelt) did not show an effect on either sampling date, even at 100 percent effluent.

D. Designated Uses and Surface Water Quality Criteria

Applicable designated uses and surface water quality criteria are defined in chapter 173-201A WAC. In addition, the U.S. EPA set human health criteria for toxic pollutants (40 CFR 131.36). Criteria applicable to this facility's discharge are summarized below in **Table 7**.

Aquatic life uses are designated using the following general categories. All indigenous fish and non-fish aquatic species must be protected in waters of the state.

- (a) **Extraordinary quality** salmonid and other fish migration, rearing, and spawning; clam, oyster, and mussel rearing and spawning; crustaceans and other shellfish (crabs, shrimp, crayfish, scallops, etc.) rearing and spawning.
- (b) **Excellent quality** salmonid and other fish migration, rearing, and spawning; clam, oyster, and mussel rearing and spawning; crustaceans and other shellfish (crabs, shrimp, crayfish, scallops, etc.) rearing and spawning.
- (c) **Good quality** salmonid migration and rearing; other fish migration, rearing, and spawning; clam, oyster, and mussel rearing and spawning; crustaceans and other shellfish (crabs, shrimp, crayfish, scallops, etc.) rearing and spawning.
- (d) **Fair quality** salmonid and other fish migration.

The Aquatic Life Uses for this receiving water (Hylebos Waterway) are identified below.

Table 7 Aquatic Life Uses & Associated Criteria

Good quality	
Temperature Criteria – Highest 1D MAX	19°C (66.2°F)
Dissolved Oxygen Criteria – Lowest 1 Day Minimum	5.0 mg/L
Turbidity Criteria	<ul style="list-style-type: none"> • 10 NTU over background when the background is 50 NTU or less; or • A 20 percent increase in turbidity when the background turbidity is more than 50 NTU.
pH Criteria	pH must be within the range of 7.0 to 8.5 with a human-caused variation within the above range of less than 0.5 units.

- To protect **shellfish harvesting**, fecal coliform organism levels must not exceed a geometric mean value of 14 colonies/100 mL, and not have more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 43 colonies/100 mL.
- The **recreational uses** are primary contact recreation and secondary contact recreation.

The recreational uses for this receiving water are identified below.

Table 8 Recreational Uses

Recreational use	Criteria
Secondary Contact Recreation	Enterococci organism levels must not exceed a geometric mean value of 70 colonies/100 mL, with not more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 208 colonies/100 mL.

- The **miscellaneous marine water uses** are wildlife habitat, harvesting, commerce and navigation, boating, and aesthetics.

OxyChem discharges to the Hylebos Waterway which is an extension of Inner Commencement Bay. Inner Commencement Bay is included on the EPA 303(d) list for chlorinated pesticides, DDT, High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAH), dieldrin, and PCBs in tissue. Based on the characterization data Ecology does not believe that the effluent from the OxyChem ground water treatment process includes these constituents.

E. Evaluation of Surface Water Quality -Based Effluent Limits for Numeric Criteria

Temperature--The state temperature standards (WAC 173-201A-200-210 and 600-612) include multiple elements:

- Annual summer maximum threshold criteria (June 15 to September 15)
- Supplemental spawning and rearing season criteria (September 15 to June 15)

- Incremental warming restrictions
- Protections against acute effects

Ecology evaluates each criterion independently to determine reasonable potential and derive permit limits.

- **Annual summer maximum and supplementary spawning/rearing criteria**

Each water body has an annual maximum temperature criterion [WAC 173-201A-200(1) (c), 210(1)(c), and Table 602]. These threshold criteria (e.g., 12, 16, 17.5, 20°C) protect specific categories of aquatic life by controlling the effect of human actions on summer temperatures.

Some waters have an additional threshold criterion to protect the spawning and incubation of salmonids (9°C for char and 13°C for salmon and trout) [WAC 173-201A-602, Table 602]. These criteria apply during specific date-windows.

The threshold criteria apply at the edge of the chronic mixing zone. Criteria for most fresh waters are expressed as the highest 7-Day average of daily maximum temperature (7-DADMax). The 7-DADMax temperature is the arithmetic average of seven consecutive measures of daily maximum temperatures. Criteria for marine waters and some fresh waters are expressed as the highest 1-Day annual maximum temperature (1-DMax).

- **Incremental warming criteria**

The water quality standards limit the amount of warming human sources can cause under specific situations [WAC 173-201A-200(1)(c)(i)-(ii), 210(1)(c)(i)-(ii)]. The incremental warming criteria apply at the edge of the chronic mixing zone.

At locations and times when background temperatures are cooler than the assigned threshold criterion, point sources are permitted to warm the water by only a defined increment. These increments are permitted only to the extent doing so does not cause temperatures to exceed either the annual maximum or supplemental spawning criteria.

At locations and times when a threshold criterion is being exceeded due to natural conditions, all human sources, considered cumulatively, must not warm the water more than 0.3°C above the naturally warm condition.

When Ecology has not yet completed a TMDL, our policy allows each point source to warm water at the edge of the chronic mixing zone by 0.3°C. This is true regardless of the background temperature and even if doing so would cause the temperature at the edge of a standard mixing zone to exceed the numeric threshold criteria. Allowing a 0.3°C warming for each point source is reasonable and protective where the dilution factor is based on 25 percent or less of the critical flow. This is because the fully mixed effect on temperature will only be a fraction of the 0.3°C cumulative allowance (0.075°C or less) for all human sources combined.

- **Temperature Acute Effects**

Instantaneous lethality to passing fish: The upper 99th percentile daily maximum effluent temperature must not exceed 33°C; unless a dilution analysis indicates ambient temperatures will not exceed 33°C 2-seconds after discharge.

General lethality and migration blockage: Measurable (0.3°C) increases in temperature at the edge of a chronic mixing zone are not allowed when the receiving water temperature exceeds either a 1DMax of 23°C or a 7DADMax of 22°C.

Lethality to incubating fish: Human actions must not cause a measurable (0.3°C) warming above 17.5°C at locations where eggs are incubating.

Results reported during 2007 and 2008 ranged from 8.2 – 14.3 °C for the combined effluent. This is well below the numeric water quality criteria of 19 °C. Based on these results Ecology believes there is no reasonable potential to exceed the temperature criteria. Therefore, the proposed permit does not include a temperature limit.

pH-- Compliance with the technology-based limits of 6.0 to 9.0 will assure compliance with the water quality standards of surface waters because of the high buffering capacity of marine water.

Turbidity--The permit requires turbidity monitoring to assess compliance with the water quality criteria for turbidity (see Table 5) because of potential fluctuations in turbidity of both the receiving water and the effluent.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require Ecology to place limits in NPDES permits on toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. Ecology does not exempt facilities with technology-based effluent limits from meeting the surface water quality standards. The following toxic pollutants are present in the discharge: copper and zinc. Ecology conducted a reasonable potential analysis (See Appendix D) on these parameters to determine whether it would require effluent limits in this permit. Ecology determined that copper and zinc pose no reasonable potential to exceed the water quality criteria at the critical condition using procedures given in EPA, 1991 and as described above. Ecology's determination assumes that this facility meets the other effluent limits of this permit.

F. Whole Effluent Toxicity

The water quality standards for surface waters forbid discharge of effluent that causes toxic effects in the receiving waters. Many toxic pollutants cannot be measured by commonly available detection methods. However, laboratory tests can measure toxicity directly, by exposing living organisms to the wastewater and measuring their responses. These tests measure the aggregate toxicity of the whole effluent, so this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

- *Acute toxicity tests measure mortality as the significant response* to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests find early indications of any potential lethal effect of the effluent on organisms in the receiving water.
- *Chronic toxicity tests measure various sublethal toxic responses* such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test on an organism with an extremely short life cycle, or a partial life cycle test during a critical stage of a test organism's life. Some chronic toxicity tests also measure organism survival.

Ecology-accredited WET testing laboratories use the proper WET testing protocols, fulfill the data requirements, and submit results in the correct reporting format. Accredited laboratory staff know about WET testing and how to calculate an NOEC, LC₅₀, EC₅₀, IC₂₅, etc. Ecology gives all accredited labs the most recent version of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent*

Toxicity Test Review Criteria (<http://www.ecy.wa.gov/biblio/9580.html>), which is referenced in the permit. Ecology recommends that OxyChem send a copy of the acute or chronic toxicity sections(s) of its NPDES permit to the laboratory.

WET testing conducted during effluent characterization showed no reasonable potential for effluent discharges to cause receiving water acute or chronic toxicity. The proposed permit will not impose an acute WET limit. OxyChem must retest their combined effluent before submitting an application for permit renewal. In addition:

- If this facility makes process or material changes which, in Ecology's opinion, increase the potential for effluent toxicity, then Ecology may (in a regulatory order, by permit modification, or in the permit renewal) require the facility to conduct additional effluent characterization.
- If WET testing conducted for submittal with a permit application fails to meet the performance standards in WAC 173-205-020, Ecology will assume that effluent toxicity has increased. OxyChem may demonstrate to Ecology that effluent toxicity has not increased, by performing additional WET testing after the process or material changes have been made.

G. Human Health

Washington's water quality standards include 91 numeric human health-based criteria that Ecology must consider when writing NPDES permits. These criteria were established in 1992 by the U.S. EPA in its National Toxics Rule (40 CFR 131.36). The National Toxics Rule allows states to use mixing zones to evaluate whether discharges comply with human health criteria.

The constituents of concern (COC) in contaminated ground water are chlorinated solvents including vinyl chloride; 1,1,dichloroethylene; methylene chloride; carbon tetrachloride; trichlorethylene; 1,1,2 trichloroethane; tetrachloroethylene; and 1,1,2,2, tetrachloroethane. These COC are in the list published by U.S. EPA in its National Toxics Rule (40 CFR 131.36). OxyChem designed the ground water treatment system specifically to remove these volatile organic constituents. OxyChem has operated the treatment system for a number of years and it has continued to provide effective treatment. The proposed permit requires the discharge to meet human health criteria for these COC at the end of pipe as shown in Table 6.

H. Sediment Quality

The aquatic sediment standards (WAC 173-204) protect aquatic biota and human health. Under these standards Ecology may require a facility to evaluate the potential for its discharge to cause a violation of sediment standards (WAC 173-204-400). You can obtain additional information about sediments at the Aquatic Lands Cleanup Unit website. <http://www.ecy.wa.gov/programs/tcp/smu/sediment.html>

Through a review of the discharger characteristics and of the effluent characteristics, Ecology determined that this discharge has no reasonable potential to violate the Sediment Management Standards.

I. Ground Water Quality Limits

The Ground Water Quality Standards, (chapter 173-200 WAC), protect beneficial uses of ground water. Permits issued by Ecology must not allow violations of those standards (WAC 173-200-100). OxyChem does not discharge wastewater to ground and therefore Ecology imposed no permit limits to protect ground water.

J. Comparison Effluent Limits With Limits of The Previous Permit Issued on May 3, 2005.

The following table shows previous and proposed permit limits for the ground water treatment effluent. Ecology has reduced limits for Carbon tetrachloride; 1,1 Trichloroethylene; 1,1,2,2, Tetrachloroethane; Trichloroethylene; and Tetrachloroethylene based on best professional judgment. Ecology added a limit for vinyl chloride. Based on its previous performance, Ecology believes that OxyChem will meet the new limits with the current treatment process. The proposed limits are all at or below Water Quality Criteria.

Table 9 Comparison of Effluent Limits

Parameter	Basis of Limit	Previous Effluent Limits: Outfall # 002	Proposed Effluent Limits: Outfall # 002
		Maximum Daily	Maximum Daily
Flow		Report	Report
Chloroform	Technology	75 µg/L	75 µg/L
Carbon tetrachloride	Technology	10 µg/L	1.6 µg/L
1,1 Dichloroethylene	Technology	5 µg/L	3.2 µg/L
1,1,2 Trichloroethane	Technology	5 µg/L	5 µg/L
1,1,2,2, Tetrachloroethane	Technology	180 µg/L	4 µg/L
Trichloroethylene	Technology	440 µg/L	30 µg/L
Tetrachloroethylene	Technology	50 µg/L	3.3 µg/L
Methylene Chloride	Technology	185 µg/L	185 µg/L
Vinyl Chloride	Technology	No limit	2.4 µg/L

IV. MONITORING REQUIREMENTS

Ecology requires monitoring, recording, and reporting (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and that the discharge complies with the permit's effluent limits.

The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

A. Lab Accreditation

Ecology requires that facilities must use a laboratory registered or accredited under the provisions of chapter 173-50 WAC, *Accreditation of Environmental Laboratories* to prepare all monitoring data (with the exception of certain parameters). OxyChem does not have an in-house laboratory and therefore must use an accredited laboratory to conduct the required monitoring for the permit.

V. OTHER PERMIT CONDITIONS

A. Reporting and Recordkeeping

Ecology based permit condition S3. on our authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

B. Non Routine and Unanticipated Discharges

Occasionally, this facility may generate wastewater which was not characterized in the permit application because it is not a routine discharge and was not anticipated at the time of application. These wastes typically consist of waters used to pressure-test storage tanks or fire water systems or of leaks from drinking water systems.

The permit authorizes non-routine and unanticipated discharges under certain conditions. The facility must characterize these waste waters for pollutants and examine the opportunities for reuse. Depending on the nature and extent of pollutants in this wastewater and on any opportunities for reuse, Ecology may:

- Authorize the facility to discharge the wastewater.
- Require the facility to treat the wastewater.
- Require the facility to reuse the wastewater.

C. Spill Plan

This facility stores a quantity of chemicals on-site that have the potential to cause water pollution if accidentally released. Ecology can require a facility to develop best management plans to prevent this accidental release [section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080].

OxyChem developed a plan for preventing the accidental release of pollutants to state waters and for minimizing damages if such a spill occurs. The proposed permit requires the facility to update this plan as necessary, and to submit it to Ecology at least one time before the permit expires.

D. Solid Waste Control Plan

OxyChem could cause pollution of the waters of the state through inappropriate disposal of solid waste or through the release of leachate from solid waste. OxyChem developed a plan for managing their solid wastes to prevent this. The proposed permit requires the facility to update this plan as necessary, and to submit it to Ecology at least one time before the permit expires.

E. Operation and Maintenance Manual

Ecology requires industries to take all reasonable steps to properly operate and maintain their wastewater treatment system in accordance with state and federal regulations (40 CFR 122.41(e) and WAC 173-220-150 (1)(g)). The facility has prepared and submitted an operation and maintenance manual as required by state regulation for the construction of wastewater treatment facilities (WAC 173-240-150). Implementation of the procedures in the operation and maintenance plan ensures the facility's compliance with the terms and limits in the permit. The proposed permit requires the facility to review and update this plan at least annually, and confirm this review by letter to Ecology.

F. Stormwater Pollution Prevention Plan

OxyChem prepared a Stormwater Pollution Prevention Plan (SWPPP) during the existing permit cycle. The SWPPP, dated November 2008, incorporates best management practices to minimize contamination of stormwater accumulated around the ground water treatment system (contact stormwater) and other areas of the facility (facility-wide non-contact stormwater). Secondary containment surrounds the entire treatment plant components (e.g., tanks, air strippers, carbon units, catalytic oxidizer and all connecting piping) to contain spill and other liquid and solid releases associated with the treatment process. The proposed permit requires the facility to update this plan as necessary, and to submit it to Ecology at least one time before the permit expires.

G. General Conditions

Ecology bases the standardized General Conditions on state and federal law and regulations. They are included in all individual industrial NPDES permits issued by Ecology.

VI. PERMIT ISSUANCE PROCEDURES

A. Permit Modifications

Ecology may modify this permit to impose numerical limits, if necessary to comply with water quality standards for surface waters, with sediment quality standards, or with water quality standards for ground waters, after obtaining new information from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

Ecology may also modify this permit to comply with new or amended state or federal regulations.

B. Proposed Permit Issuance

This proposed permit includes all statutory requirements for Ecology to authorize a wastewater discharge. The permit includes limits and conditions to protect human health and aquatic life, and the beneficial uses of waters of the state of Washington. Ecology proposes to issue this permit for a term of five years.

VII. REFERENCES FOR TEXT AND APPENDICES

Environmental Protection Agency (EPA)

2006. National Recommended Water Quality Criteria. EPA/4304T

1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.

1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.

1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.

1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

1994. Permit Writer's Manual. Publication Number 92-109

Washington State Department of Ecology.

2007. Focus Sheet on Solid Waste Control Plan, Developing a Solid Waste Control Plan for Industrial Wastewater Discharge Permittees. Publication Number 07-10-024

Washington State Department of Ecology.

Laws and Regulations (<http://www.ecy.wa.gov/laws-rules/index.html>)

Permit and Wastewater Related Information
(<http://www.ecy.wa.gov/programs/wq/wastewater/index.html>)

Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(E2). (Cited in EPA 1985 op.cit.)

Occidental Chemical Corporation.

May 2008. Emergency Response & Contingency Plan – Ground water Treatment Facility. Occidental Chemical Corporation/Glenn Springs Holding, Inc., 605 Alexander Avenue, Tacoma, Washington

April 2008. Solid waste Control Plan - Ground water Treatment Facility. Occidental Chemical Corporation/Glenn Springs Holding, Inc., 605 Alexander Avenue, Tacoma, Washington

November 2008. Stormwater Pollution Prevention Plan – Ground water Treatment Facility. Occidental Chemical Corporation/Glenn Springs Holding, Inc., 605 Alexander Avenue, Tacoma, Washington

December 2008. Application for NPDES Permit Reissuance. Occidental Chemical Corporation. WA0037265. Tacoma, Washington

January 2009. Conestoga-Rover& Associates. Operation and Maintenance Manual, Ground water Treatment Facility. Occidental Chemical Corporation/Glenn Springs Holding, Inc., 605 Alexander Avenue, Tacoma, Washington

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

Ecology proposes to reissue a permit to Occidental Chemical Corporation. The permit prescribes operating conditions and wastewater discharge limits. This fact sheet describes the facility and Ecology's reasons for requiring permit conditions.

Ecology will place a Public Notice on July 22, 2009, in the *Tacoma News Tribune* to inform the public and to invite comment on the proposed reissuance of this National Pollutant Discharge Elimination System permit as drafted.

The Notice –

- Tells where copies of the draft Permit and Fact Sheet are available for public evaluation (a local public library, the closest Regional or Field Office, posted on our website.).
- Offers to provide the documents in an alternate format to accommodate special needs.
- Asks people to tell us how well the proposed permit would protect the receiving water.
- Invites people to suggest fairer conditions, limits, and requirements for the permit.
- Invites comments on Ecology's determination of compliance with antidegradation rules.
- Urges people to submit their comments, in writing, before the end of the comment period
- Tells how to request a public hearing about the proposed NPDES Permit.
- Explains the next step(s) in the permitting process.

Ecology has published a document entitled **Frequently Asked Questions about Effective Public Commenting** which is available on our website at <http://www.ecy.wa.gov/biblio/0307023.html>.

You may obtain further information from Ecology by telephone, 360-407-6280, or by writing to the permit writer at the address listed below.

Industrial Unit Permit Coordinator
Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, Washington 98504-7775

The primary author of this permit and fact sheet is Martin Werner, P.E .

APPENDIX B--GLOSSARY

1-DMax or 1-day maximum temperature--The highest water temperature reached on any given day. This measure can be obtained using calibrated maximum/minimum thermometers or continuous monitoring probes having sampling intervals of 30 minutes or less.

7-DADMax or 7-day average of the daily maximum temperatures--The arithmetic average of seven consecutive measures of daily maximum temperatures. The 7-DADMax for any individual day is calculated by averaging that day's daily maximum temperature with the daily maximum temperatures of the three days prior and the three days after that date.

Acute Toxicity--The lethal effect of a compound on an organism that occurs in a short period of time, usually 48 to 96 hours.

AKART--The acronym for "all known, available, and reasonable methods of prevention, control and treatment." AKART is a technology-based approach to limiting pollutants from wastewater discharges which requires an engineering judgment and an economic judgment. AKART must be applied to all wastes and contaminants prior to entry into waters of the state in accordance with RCW 90.48.010 and 520, WAC 173-200-030(2)(c)(ii), and WAC 173-216-110(1)(a).

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Annual Average Design Flow (AADF)--The average of the daily flow volumes anticipated to occur over a calendar year.

Average Monthly Discharge Limit--The average of the measured values obtained over a calendar month's time.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD5--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD5 is used in modeling to measure the reduction of dissolved oxygen in receiving waters after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Compliance Inspection--Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection--With Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations. In addition it includes as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Ecology may conduct additional sampling.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring--Uninterrupted, unless otherwise noted in the permit.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Detection Limit--See Method Detection Level.

Dilution Factor (DF)--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the percent effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10 percent by volume and the receiving water 90 percent.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report must contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short a period of time as is feasible.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Major Facility--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limit--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Maximum Day Design Flow (MDDF)--The largest volume of flow anticipated to occur during a one-day period, expressed as a daily average.

Maximum Month Design Flow (MMDF)--The largest volume of flow anticipated to occur during a continuous 30-day period, expressed as a daily average.

Maximum Week Design Flow (MWDF)--The largest volume of flow anticipated to occur during a continuous 7-day period, expressed as a daily average.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99 percent confidence that the pollutant concentration is above zero and is determined from analysis of a sample in a given matrix containing the pollutant.

Minor Facility--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone--An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in state regulations (chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

pH--The pH of a liquid measures its acidity or alkalinity. It is the negative logarithm of the hydrogen ion concentration. A pH of 7.0 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Peak Hour Design Flow (PHDF)--The largest volume of flow anticipated to occur during a one-hour period, expressed as a daily or hourly average.

Peak Instantaneous Design Flow (PIDF)--The maximum anticipated instantaneous flow.

Quantitation Level (QL)--The smallest detectable concentration of analyte greater than the Detection Limit (DL) where the accuracy (precision & bias) achieves the objectives of the intended purpose. This may also be called Minimum Level or Reporting Level.

Reasonable Potential--A reasonable potential to cause a water quality violation, or loss of sensitive and/or important habitat.

Responsible Corporate Officer-- A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or have gross annual sales or expenditures exceeding \$25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to receiving waters may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Solid Waste--All putrescible and non-putrescible solid and semisolid wastes including, but not limited to, garbage, rubbish, ashes, industrial wastes, swill, sewage sludge, demolition and construction wastes, abandoned vehicles or parts thereof, contaminated soils and contaminated dredged material, and recyclable materials.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limits because of factors beyond the reasonable control of the facility. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into receiving waters.

APPENDIX C--RESPONSE TO COMMENTS

APPENDIX D—REASONABLE POTENTIAL ANALYSIS

Parameter	State Water Quality Standard										Max concentration at edge of...																	
	Metal Criteria Translator as decimal		Metal Criteria Translator as decimal		Ambient Concentration (measured as dissolved)		Acute Chronic		Acute Chronic		Acute Chronic		LIMIT REQ'D?		Effluent percentile value		Max effluent measured conc. (measured as recoverable)		Coeff Variation CV		# of samples n		Multiplier		Acute Dfn Factor		Chronic Dfn Factor	
	Acute	Chronic	Acute	Chronic	Acute	Chronic	Acute	Chronic	Acute	Chronic	Acute	Chronic	Acute	Chronic	Acute	Chronic	Pa	up/L	up/L	s	n	6	2.14	2.7	15.0	6	2.14	2.7
COPPER	0.83	0.83	1.80	4.80	3.10	3.57	2.12	NO	NO								0.607	3.70	0.60	0.55	6	2.14	2.7	15.0	6	2.14	2.7	15.0
ZINC	0.95	0.95	10.50	90.00	81.00	17.12	11.69	NO	NO								0.507	14.00	0.60	0.55	6	2.14	2.7	15.0	6	2.14	2.7	15.0

APPENDIX E —PROCESS FLOW DIAGRAM

